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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/333,049	06/15/1999	HIROSHIGE HIRANO	0819-255	3672

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EXAMINER

PHAM, HOAI V

ART UNIT PAPER NUMBER

2814

DATE MAILED: 09/17/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/333,049

Applicant(s)

HIRANO ET AL.

Examiner

Hoai V Pham

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 26 June 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 12 and 13 is/are allowed.
- 6) ☒ Claim(s) 1-11 and 15-16 is/are rejected.
- 7) ☒ Claim(s) 14 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Claim Objections

1. Claims 9-10 and 14 are objected to because of the following informalities:

Claims 9-10 should be canceled because the claim 9-10 are the same limitations with the claims 8 and 11.

Claim 14 should be canceled because claim 14 is the same the limitations with the base claim 12 (see lines 29-35).

Appropriate correction is required.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 1-11 and 15-16 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 1 and 15, the phrase "wherein the first interconnection layer extends in a same direction orthogonal to the extending direction of the bottom electrode, not extending in an opposite direction, with respect to the top and bottom electrodes" renders the claim indefinite. It is not clear that which direction is considered as a same direction and an opposite direction.

Claims 8 and 9 recite the limitation "the second interconnection layer" in line 5.

There is insufficient antecedent basis for this limitation in the claim.

Claim 10 recites the limitation "the second interconnection layer" in line 1. There is insufficient antecedent basis for this limitation in the claim.

Claim 11 recites the limitation "the second interconnection layer" in lines 1-2.

There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. Claims 1, 2, 4, 6-7, 15 and 16, as best understood, are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant Admitted Prior Art (figs. 4-5, pages 2-3) in view of Chinu et al. [JP. 11121705 A] (applicant IDS) previously applied.

With respect to claims 1 and 15, Applicant Admitted Prior Art discloses a ferroelectric memory device comprising:

- a ferroelectric capacitor including a top electrode (58), a bottom electrode (56) and a ferroelectric film (57) interposed between the top and bottom electrodes, the top electrode having a rectangular planar pattern;

- a memory cell transistor including first and second doped layers (53) and a gate (54), the memory cell transistor controlling a voltage supplied to the top electrode of the ferroelectric capacitor;

- a first interlevel dielectric film (59) formed over the memory cell transistor and the ferroelectric capacitor (see fig. 5);

- a first interconnection layer (60) formed on the first interlevel dielectric film (see fig. 5); and

- a memory cell composed of the ferroelectric capacitor and the memory cell transistor (see fig. 5),

wherein, in a planar layout of the ferroelectric memory device, the first interconnection layer (60) partially overlaps with the top and bottom electrodes of the ferroelectric capacitor, and does not cover at least one side of the rectangular top electrode (58) and the bottom electrode (56) (see fig. 4),

wherein memory cell comprises a memory cell array arranged in a matrix (see fig. 4),

wherein the first interconnection layer extends orthogonal to the top and bottom electrodes and a bit line (DBL) formed above the top electrode (see fig. 4);

wherein a plurality of the top electrode is arranged only in a row with respect to the direction of the length of the bottom electrode (see fig. 4).

Applicant Admitted Prior Art fails to show that the width of the bit line formed above the top electrode is smaller than the distance between the top electrode and another top electrode adjacent to the top electrode. However, Chinu et al. discloses that the width of a bit line (B/L) formed above the top electrode (67a) is smaller than the distance between the top electrode and another top electrode adjacent to the top electrode (see figures 4 and 6 and the abstract). Therefore, it would have been obvious to the skilled in the art to modify the memory device of Applicant Admitted Prior Art by forming the bit line with the structure as set forth above because according to Chinu et al. such memory device would prevent coupling capacitance between the interconnection layer and top electrode or between the bit line and the top electrode.

With respect to claims 2, 4, and 6, referencing the reasons given above, Chinu et al. discloses a storage line (73) connected to the top electrode of the ferroelectric capacitor and to the first doped layer (57a) of the memory cell transistor, the storage line having a linear planar pattern; and the bit line (77) connected to the second doped layer (57b) of the memory cell transistor, wherein the storage line intersects only one

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side of the top electrode in the planar layout and wherein the bit line does not overlap with the top electrode in the planar layout (see figs. 4 and 6).

With respect to claims 7 and 16, Applicant Admitted Prior Art discloses that the first interconnection layer is containing at least one of aluminum and copper (see page 2 and lines 20-22).

7. Claims 8-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chinu et al. [JP. 11121705 A] (applicant IDS), previously applied, in view of Hayashi et al. [U.S. Pat. 6,174,766 B1] previously applied.

Chinu et al. does not disclose that an upper interlevel dielectric film formed to cover the first interconnection layer and an upper interconnection layer formed on the upper interlevel dielectric film. However, Hayashi et al. shows that it is known in the art to have an upper interlevel dielectric film (27) formed to cover the first interconnection layer (24, aluminum) and an upper interconnection layer (30, aluminum) formed on the upper interlevel dielectric film (see figure 13, col.13, lines 44+). Therefore, it would have been obvious to the skilled in the art to include the an upper interconnection layer as taught by Hayashi et al. in the device of Chinu et al. to provide an electrical connection to other circuit.

Allowable Subject Matter

8. Claims 12-13 are allowed.

Response to Arguments

9. Applicant's arguments filed 6/26/03 have been fully considered but they are not persuasive because the amended limitation "wherein the first interconnection layer extends in a same direction orthogonal to the extending direction of the bottom electrode, not extending in an opposite direction, with respect to the top and bottom electrodes" is indefinite as being explained above.

Conclusion

10. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

11. A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

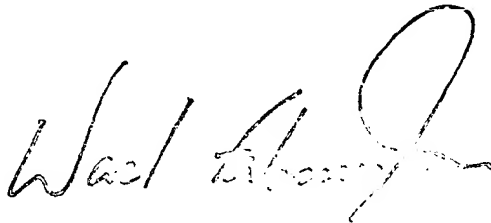
12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hoai V Pham whose telephone number is 703-308-6173. The examiner can normally be reached on 7:30A.M. - 6:00P.M..

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13. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael M. Fahmy can be reached on 703-308-4918. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

14. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

HP
Hoai Pham
September 9, 2003


SUPERVISOR, PRIMARY EXAMINER
TECHNOLOGY CENTER (2000)